

AMENDMENTS TO THE CLAIMS:

1-21. (canceled)

22. (currently amended) A medical system comprising:

a carrier;

a multiplicity of electromechanical transducers mounted to said carrier;

energization means operatively connected to a first plurality of said transducers for supplying same with electrical signals of at least one pre-established ultrasonic frequency to produce first pressure waves in the patient; and

a control unit operatively connected to said energization means for operating same to produce said first pressure waves in the patient, said control unit including an electronic analyzer operatively connected to a second plurality of said transducers for performing electronic 3D volumetric data acquisition and imaging of internal tissues of the patient by analyzing signals generated by said second plurality of said transducers in response to second pressure waves produced at internal tissues of the patient in response to said first pressure waves, said control unit being operatively connected to said second plurality of said transducers to gather and organize data from said second plurality of said transducers so that said second plurality of transducers define a plurality of data gathering apertures, said control unit including circuitry for coherent aperture combining to coherently combine structural data from the respective apertures,

said carrier including a plurality of rigid substrates each disposable in pressure-wave transmitting contact with the patient, each of said substrates carrying a respective plurality of said transducers, each of said substrates carrying at least one of said second plurality of said

transducers so that each of said substrates represents a respective one of said data gathering apertures,

said substrates being movably connected to one another, said circuitry including position determination or calibration componentry determining relative positions and orientations of said substrates relative to one another, said position determination or calibration componentry including a multiplicity of point scatterers, said position determination or calibration componentry further including programmed componentry operatively connected to said energization means for periodically scanning said point scatterers with first ultrasonic pressure waves and calculating instantaneous positions of said point scatterers as scanned by each of said substrates using second ultrasonic pressure waves produced at said point scatterers in response to said first ultrasonic pressure waves.

23-25. (canceled)

26. (currently amended) The system defined in claim [[25]] 22 wherein said electronic analyzer includes circuit components for sampling data from said second plurality of said transducers so that at least some of said transducers form a plurality of data gathering apertures, said control unit including coherent aperture combining circuitry for coherently combining structural data from the respective apertures, said position determination or calibration means componentry including circuitry for executing a self-cohering algorithm (a) computing relative positions and orientations of said substrates using instantaneous position measurements and (b) adjusting signals from coherently combined apertures to enable constructive addition of said signals from said coherently combined apertures.

27. (currently amended) The system defined in claim [[25]] 22 wherein said position determination or calibration ~~means~~ componentry includes ~~means for a programmed electronic device~~ executing computations according to a self-cohering algorithm.

28. (currently amended) The system defined in claim [[24]] 22 wherein said position determination or calibration ~~means~~ componentry includes programmed componentry operatively connected to said energization means for periodically energizing at some of said transducers with at least one predetermined electrical frequency and calculating instantaneous positions of the transducers so energized.

29. (currently amended) The system defined in claim [[23]] 22, further comprising at least one display operatively connected to said analyzer for providing an image of said internal tissue structures of the patient.

30. (currently amended) The system defined in claim [[23]] 22 wherein said substrates are connected to one another via a flexible linkage so that said substrates are extendable at a variable angle with respect to one another.

31-42. (canceled)